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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/605,271	06/28/2000	Christopher Henry Rohrs	20030840-1	5332

7590 02/23/2004	EXAMINER

IP ADMINISTRATION , LEGAL DEPARTMENT
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ART UNIT	PAPER NUMBER
2175	13

DATE MAILED: 02/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Applicati n N..	Applicant(s)
	09/605,271	ROHRS, CHRISTOPHER HENRY
	Examin r	Art Unit
	Neveen Abel-Jalil	2175

-- *The MAILING DATE of this communication appears on the cov r sheet with the correspondenc address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _21 November 2003_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-26_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-26_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
   application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on 11/21/2003 has been entered.

2.   The amendment filed on November 21, 2003 has been received and entered. Claims 1-26

are pending.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United
> States before the invention thereof by the applicant for patent, or on an international application by another who
> has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention
> thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999

(AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002

do not apply when the reference is a U.S. patent resulting directly or indirectly from an

international application filed before November 29, 2000. Therefore, the prior art date of the

reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA

35 U.S.C. 102(e)).

4.   Claims 1, 9, 17, and 25-26 are rejected under 35 U.S.C. 102(e) as being anticipated by

Alpern et al. (U.S. Patent No. 6,470,361 B1).

        As to claims 1, 9, 17, and 25-26, Alpern et al. discloses a collector for collecting non-

referenced objects stored in a heap by a program executing in a computer system comprising:

        an object allocation routine which stores an object of a particular type in one of a

plurality of logical partitions in the heap dependent on a predefined category assigned to the

object type, such that each object of a certain category is stored in one logical partition of the

heap and objects of a category different from the certain category are stored in a logical partition

different from the one logical partition (See column 3, lines 23-65, also see column 5, lines 33-

67, and see column 6, lines 1-26); and

        a collection routine which searches one of the logical partitions of the heap for objects to

which references are made and reclaims non-referenced objects stored in the searched logical

partition of the heap (See columns 22-23, claims 34-35 language, also see column 4, lines 23-

67).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 2-3, 6-8, 10-11, 14-16, 18-19, and 22-24 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Alpern et al. (U.S. Patent No. 6,470,361 B1) in view of Engelstad et al.

(U.S Patent No. 5,485,613).

As to claims 2, 10 and 18, Alpern et al. discloses further comprising:

a sample and logical partition routine which defines a category of an object stored in the

heap logical partition (See column 21, claim 30 language) .

Alpern et al. does not teach in the heap to be hot or cold.

Engelstad et al. teaches in the heap to be hot or cold (See column 9, lines 5-19, wherein

"hot" reads on "permanent", and wherein "cold" reads on "temporary", and see column 27, lines

52-67, and column 28, lines 1-6, wherein "heap" reads on "memory" since a heap is defined by -

-dictionary.com as an area of memory used for dynamic memory allocation where blocks of

memory are allocated and freed in an arbitrary order and the pattern of allocation and size of

blocks is not known until run time).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to have modified Alpern et al. to include in the heap to be hot or cold.

It would have been obvious to one of ordinary skill in the art at the time the invention

was made to have modified Alpern et al. by the teaching of Engelstad et al. to include in the heap

to be hot or cold because dividing and indicating the heap by age mortality of the object reduces

memory processing and freeing up memory storage space.

As to claims 3, 11 and 19, Alpern et al. as modified discloses wherein upon determining

that a hot logical partition is full (See column 15, lines 15-65), the collection routine searches a

cold logical partition and the hot logical partition (See Engelstad et al. column 23, lines 14-36,

wherein "searches" reads on "scanned", and Engelstad et al. column 9, lines 5-19, wherein "hot"

reads on "permanent", and wherein "cold" reads on "temporary") for referenced objects and

moves referenced objects (See Engelstad et al. column 24, lines 13-27) of the hot category stored

in the hot logical partition to the cold logical partition (See Engelstad et al. column 9, lines 5-19,

wherein "hot" reads on "permanent", and wherein "cold" reads on "temporary").

As to claims 6, 14 and 22, Alpern et al. as modified discloses wherein the sample and

partition routine defines the object category dependent on object type mortality (See Engelstad et

al. column 3, lines 1-16, wherein "mortality" reads on "time of creation", also see Alpern et al.

column 13, lines 10-42).

As to claims 7, 15 and 23, Alpern et al. as modified discloses wherein the sample and

partition routine estimates the object mortality (See Engelstad et al. column 3, lines 1-16,

wherein "mortality" reads on "time of creation") dependent on difference of the number of bytes

of the object type stored in the heap before a collection and the number of bytes of the object

type stored in the heap after the collection (See column 18, claims 1-3 language, and see column 18, lines 1-31).

As to claims 8, 16 and 24, Alpern et al. as modified discloses wherein the sample and partition routine partitions the heap to minimize intergenerational pointers (See Engelstad et al. column 16, lines 35-55, wherein "intergenerational" reads on "previous ...next") between a hot logical partition and a cold logical partition (See Engelstad et al. column 9, lines 5-19, wherein "hot" reads on "permanent", and wherein "cold" reads on "temporary").

7.   Claims 4-5, 12-13, and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alpern et al. (U.S. Patent No. 6,470,361 B1) in view of Engelstad et al. (U.S Patent No. 5,485,613) as applied to claims 2-3, 6-8, 10-11, 14-16, 18-19, and 22-24 above, and further in view of Endicott et al. (U.S. Patent No. 6,047,295).

As to claims 4, 12 and 20, Alpern et al. as modified discloses wherein the sample and partition further comprises:

for intergenerational pointers (See abstract, also see column 3, line 54-67, and see Engelstad et al. column 16, lines 35-55, wherein "intergenerational" reads on "previous ...next") between an object stored in a hot logical partition and an object stored in a cold logical partition (See Engelstad et al. column 9, lines 5-19, wherein "hot" reads on "permanent", and wherein "cold" reads on "temporary").

Alpern et al. as modified still does not teach a write barrier elimination routine, which eliminates a write barrier.

Endicott et al. teaches a write barrier elimination routine, which eliminates a write barrier (See Endicott et al. column 12, lines 1-14, also see column 10, lines 11-20, and column 10, lines 48-59).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified Alpern et al. as modified to include a write barrier elimination routine, which eliminates a write barrier.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified Alpern et al. as modified by the teaching of Endicott et al. to include a write barrier elimination routine, which eliminates a write barrier because providing a write barrier ensure proper synchronization with the garbage collector and protect data from being lost thereby reducing overhead.

As to claims 5, 13 and 21, Alpern et al. as modified discloses wherein the write barrier elimination routine eliminates a write barrier by replacing a write barrier machine code instruction with a no operation machine code instruction (See Endicott et al. column 12, lines 1-14, also see column 10, lines 11-20, and column 10, lines 48-59, also see Alpern et al. column 14, lines 6-30).

Response to Arguments

8.   Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neveen Abel-Jalil whose telephone number is 703-305-8114. The examiner can normally be reached on 8:00AM-4: 30PM.

` If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici can be reached on 703-305-3830. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CHARLES RONES
PRIMARY EXAMINER

Neveen Abel-Jalil
February 6, 2004